

A STUDY OF THE LEECHES OF MICHIGAN

WITH KEY TO ORDERS, SUBORDERS AND SPECIES

JOHN A. MILLER
Ohio State University

The leeches referred to in this study were collected in the state of Michigan in 1925, 1926, and 1927 by Dr. Y. Metzelaar and assistants of the University of Michigan. They were secured for study from the Museum of Zoology through the courtesy of Dr. Carl Hubbs of the University of Michigan and Dr. Raymond C. Osburn of the Ohio State University.

CONSPECTUS OF THE LEECHES OF MICHIGAN

ORDER 1. RHYNCHOBDELLA

FAMILY GLOSSIPHONIDAE

- Genus *Glossiphonia*, Johnston, 1816.
 - Glossiphonia stagnalis* (Linnaeus) 1758.
 - Glossiphonia complanata* (Linnaeus) 1758.
- Genus *Placobdella*, Blanchard, 1893.
 - Placobdella montifera* Moore, 1912.
 - Placobdella parasitica* (Say) 1824.
 - Placobdella picta* (Verrill) 1872.
 - Placobdella rugosa* (Verrill) 1874.

ORDER 2. ARHYNCHOBDELLA

SUBORDER 1. GNATHOBDELLA

FAMILY HIRUDINIDAE

- Genus *Macrobdella*, Verrill, 1872.
 - Macrobdella decora* (Say) 1824.
- Genus *Haemopsis*, Savigny, 1874.
 - Haemopsis marmoratis* (Say) 1824.
 - Haemopsis lateralis* (Say) 1824.
 - Haemopsis plumbeus* Moore 1912.
 - Haemopsis grandis* (Verrill) 1874.

SUBORDER 2. HERPOBDELLIDA

FAMILY HERPOBDELLIDAE

- Genus *Herpobdella*, Blainville.
 - Herpobdella punctata* (Leidy) 1870.
- Genus *Dina*, Blanchard.
 - Dina fervida* (Verrill) 1871.

KEY TO THE ORDERS AND SUB-ORDERS

ORDER 1. RHYNCHOBDELLA.

The mouth is a small pore in the anterior sucker, from which a muscular proboscis can be protruded and retracted. No jaws present. Two families, Glossiphoniidae taken in this collection and Ichthyobdellidae not found in this collection but previously reported in other collections. (1A to II in key).

ORDER 2. ARHYNCHOBDELLA.

No proboscis present. This order includes two suborders:

SUBORDER 1. GNATHOBDELLA.

A large mouth usually with toothed jaws, pharynx not forming a protrusible proboscis. This suborder includes one family, Hirudinidae (11 to 2A).

SUBORDER 2. HERPOBDELLIDA.

Mouth medium, not armed with true jaws. No gastric caeca. Habits predaceous. This suborder includes one family, Herpobdellidae (2A in key).

ARTIFICIAL KEY TO SPECIES IN COLLECTION

1. Mouth a small pore in the anterior sucker, from which a muscular proboscis can be protruded; no jaws.
 - 1A. Complete somites essentially triannulate.
 - 1a. Eyes one pair, distinct, not contiguous in middle line. Genital pores separated by one annulus.
 - 1b. A conspicuous dark brown cuticular plate and gland on the dorsum. Color: Pale pink, grayish or brownish..... *Glossiphonia stagnalis*
 - 2a. Eyes in several pairs. Genital pores separated by two annuli.
 - 1b. Eyes in three pairs in nearly parallel rows. Seven pairs of gastric caeca. Nine pairs of testes. Body with a pair of dark longitudinal lines, above and below. Color: Brownish green with flecked dorsum. Body moderately thick and deeply pigmented, *Glossiphonia complanata*
 - 3a. Eyes one pair, compound. Seven pairs of branched gastric caeca. Side moderate to large.
 - 1b. Anterior somites widened to form discoid head.
 - 1c. Dorsum marked with three strongly papillated keels. Gastric caeca much branched. Color: Greenish brown, yellow marginal spots..... *Placobdella montifera*
 - 2b. Anterior somites not widened to form discoid head.
 - 1c. Body broad and flat, anterior sucker fused, posterior sucker free and distinct. Dorsal papillae few. Color: Pattern variable. Body green with yellow head, triangular reddish brown marginal spots, ventral surface striped..... *Placobdella parasitica*
 - 2c. Body smooth, much depressed, broad posteriorly, somewhat tapering anteriorly. Ocular region surrounded by triangular white area. Color: Dark brownish green, finely variegated with orange; a row of semicircular orange spots along the margin, *Placobdella picta*
 - 3c. Body much depressed. Dorsal papillae numerous, variable in conspicuousness, though usually rough and high. Median row forms a conspicuous interrupted line. Color: A mixture of browns, greens and yellows..... *Placobdella rugosa*
 - II. No proboscis. Mouth large, occupying entire cavity of the oral sucker.
 - 1A. Eyes five pairs on somites two to six, arranged in a submarginal arc. Genital ducts complex, muscular protrusible penis usually present. Testes paired, usually nine or ten pairs. Stomach provided with gastric caeca.

- 1a. Jaws prominent, teeth numerous, in one series, caeca along entire stomach.
- 1b. Genital orifices separated by five annuli. Dorsum with metameric, median red and marginal black spots. **Macrobdella decora**
- 2a. Jaws small, provided with few teeth. Genital orifices separated by five annuli.
- 1b. Twelve to sixteen pairs of teeth on each jaw. Color: Variable, usually non-metamerically blotched with black. **Haemopsis marmoratis**
- 2b. Twenty to twenty-five pairs of teeth on each jaw. Color: Uniform dark olive green, a dark median longitudinal stripe, a paler marginal stripe, often approaching a buff. Few or no blotches, **Haemopsis lateralis**
- 3a. Jaws absent, no teeth present.
- 1b. Lip broad and flat. Few dorsal blotches or entirely wanting. No ventral blotches. Color: Uniform plumbeous or slaty-gray. Along the entire lateral margin there is a conspicuous rufous or orange band. **Haemopsis plumbeous**
- 2b. Lips thin, mouth moderate, caudal sucker round, broadly attached, slightly cupped. Male orifice at XI-b⁵/b⁶, female orifice at XII-b⁵/b⁶. Ovaries in somite XII. Size large, inhabits borders of bodies of water. Color: (Preserved) plumbeous, slaty black, no conspicuous marks. (According to Moore, protruded penis slender and straight, ground color paler than dorsal, dark blotches present), **Haemopsis grandis**
- 2A. Eyes three or four pairs, not arranged in a regular arch. One or two pairs on somite two, and two pairs on the sides of the mouth on somite four. No jaws, no gastric caeca. Testes numerous, not paired. Predaceous.
- 1a. Eyes three pairs, first pair largest. Body elongate, sides nearly parallel. Color: Brownish gray, margin tinted red by lateral blood vessels. Rows of black spots arranged irregularly on dorsum, **Herpobdella punctata**
- 2a. Eyes usually three pairs. Body depressed posteriorly, rounded anteriorly. Large caudal sucker. Color: A dusky reddish brown, dorsum marked with double row of black spots. Genital pores separated by two annuli. **Dina fervida**

RECORD OF DISTRIBUTION

Glossiphonia stagnalis (Linnaeus) 1758.

Flint Creek, Hubbs and Schultz, 1926.

Glossiphonia complanata (Linnaeus) 1758.

Osego Lake, Metzelaar, Aug. 23, 1925.

Hunt Creek, Metzelaar and Langlois, July 17, 1925.

Pool, Mecoshe Co., 7 mm. Metzelaar, June 11, 1925.

Sucker River, Luce Co., 81 mm. Metzelaar and Langlois, June 19, 1925.

Spectacle Lake, 6 mm. Metzelaar and Langlois, June 18, 1925.

Placobdella montifera Moore 1912.

Cheboygan Co., Indian River, 2 mm. Metzelaar and Langlois, June 14, 1925.

Placobdella parasitica (Say) 1824.

Dog Lake, Cheboygan Co., 3 mm. Metzelaar, August 12, 1925.

North Twin Lake, Cheboygan Co., 2 mm. Metzelaar and Langlois, August, 1925.

Raisin River, Langlois, May 12, 1927.

Stony Lake, Jackson Co., Metzelaar, June, 1926.

Long Lake, 2 mm. Metzelaar and Langlois, July 23, 1925.

*Pere Marquette River, Lake Co., 5 cm. (with 12 young), Metzelaar, March 15, 1925.

Dollar Pond, near Black River, Cheboygan Co., 3.5 cm. Metzelaar and Langlois, August 13, 1925.

*Note the dates at which *Placobdella parasitica* was taken with young attached.

Placobdella parasitica [Continued]

Avery Lake, Thunder Bay River, drainage, Montmorency Co., 2.5 cm.
Metzelaar and Langlois, July 8, 1925.

Newago Co., Langlois and Moody.

*S-Lake, Montmorency Co., 3 cm. with young, Metzelaar and Langlois, July 22, 1925.

Sucker River, Luce Co., 2.5 cm. Metzelaar and Langlois, June 19, 1925.

Placobdella picta (Verrill) 1872.

Bunners Creek, 1926.

Placobdella rugosa (Verrill) 1874.

Big South Branch, Pere Marquette, Newago Co., 2.8 mm. Metzelaar and Langlois, July 22, 1926.

Luce Co., Pike Lake Forest Reserve, Langlois and Metzelaar, June 18, 1925.

Valentine Lake, Montmorency Co., 1.5 mm. Metzelaar and Langlois, July 5, 1925.

Pickeral Creek, near P. Lake, Newaygo Co., 3 cm. with young, Langlois and Moody, July 7, 1926.

Bass Lake, Metzelaar, May 12, 1926.

Station 120, Metzelaar, 1925.

Newago Lake, Langlois and Moody.

Lookwood Lake, Montmorency Co., Langlois and Metzelaar, July 14, 1927.

Northern Tomohawk Lake, Montmorency Co., Metzelaar and Langlois, July 13, 1925.

S-Lake, Montmorency Co., 3 cm. Metzelaar and Langlois, July 22, 1925.

Sucker River, Luce Co., Metzelaar and Langlois, June 19, 1925.

Fremont Creek, 1.9 cm. Moody and Langlois.

Macrobodella decora (Say) 1824.

Thomas Lake, Osego Co., Metzelaar, 6 mm., August 24, 1925.

S-Lakes, N. W. of Gaylord, Osego Co., 5 cm. Metzelaar, Aug. 16, 1925.

Valentine Lake, Montmorency Co., July 5, 1925.

Haemopsis marmoratis (Say) 1824.

Pike Lake, Forest Reserve, Luce Co., 4.5 cm. Metzelaar and Langlois, June 18, 1925.

Hagar Lake, Metzelaar and Langlois.

Muddy Creek (120) Metzelaar, 1925.

Head of Boardman Lake, Traverne Co., Metzelaar, May 13, 1925.

Cress Brook, Metzelaar, 1925.

Back Water, Muskegon River, Metzelaar.

Luce Co., 5.5 cm. Metzelaar, May 25, 1925.

Haemopsis laterallis (Say) 1824.

Clam Creek, 6 cm. Metzelaar, May 13, 1926.

Creek in Kent Co., Metzelaar, 1927.

Haemopsis plumbeous Moore 1912.

Vicinity of Perch Lake, Lake Superior Forest Reserve, Metzelaar and Langlois, June 15, 1925.

Lac Viene, Wisconsin and Michigan border, Metzelaar and Langlois.

Thunder Bay River (Bass Lake), Metzelaar.

Forest Reserve, Luce Co., Metzelaar and Langlois, June 18, 1925.

Haemopsis grandis (Verrill) 1874.

Luce Co., Metzelaar, May 25, 1925.

Vicinity Perch Lake, Lake Superior Forest Reserve, Metzelaar and Langlois, June 15, 1925.

Muskegon drainage, Grant Township, 5 cm. Metzelaar, May 9, 1925.

Lake Superior Forest Reserve, 4 cm., June 15, 1925.

Balloger Creek, Metzelaar.

Forest Reserve, Luce Co., June 18, 1925.

Canada Creek, 4.5 cm., June 18, 1925.

Herpobdella punctata (Leidy) 1870.

Indian River, 3 mm. Langlois, June 14, 1925.

Luce Co., Metzelaar, May 25, 1925.

Bass Lake (Sta. 410), 6.5 cm. Metzelaar, May 22, 1926.

*See note page 87.

Herpobdella punctata [Continued]

- Dickerson Lake, Metzelaar and Langlois, Oct. 5, 1925.
 Gull Lake, H. W. Fowler, 1925.
 Tributary Maple Creek, Hubbs and Langlois, 1925.
 Thunder Bay River (Bass Lake), Metzelaar and Langlois, 1925.
 Pere Marquette River, Lake Co., Metzelaar.
 Head Waters of Perch Lake, 5 cm. Metzelaar and Langlois.
 Baker Creek, Neweygo Co., Langlois and Mosley, July 12, 1925.
 Lake Co., Metzelaar, March 23, 1925.
 Neweygo Co., 5 cm. Langlois and Mosley, July 10, 1926.
 Lac Viene, Wisconsin and Michigan border, Metzelaar and Langlois, Sept. 21, 1925.
 Pere Marquette River, Metzelaar, 1925.
Dina Fervida (Verrill) 1871.
 Creek Tributary to Pere Marquette River, Lake Co., Metzelaar, April 23, 1926.

The following list of species occurred in the collection taken from the state of Wisconsin:

- Glossiphonia nepheloidae* (Graff) 1899.
 Lake 6 mi. S. W. of Dixon, Columbia Co., Green and Jones, Aug. 24, 1925.
Macrobodella decora (Say) 1824.
 Wabekon Lake, Forest Co., H. T. Bolger, 6 cm.
Haemopsis plumbeus Moore 1912.
 Trout Stream, Riley Lake, Forest Co., 2.5 cm. H. T. Folger.
Haemopsis grandis (Verrill) 1874.
 Oconto and Rat River, Forest Co., 5 cm. H. T. Folger, Sept. 1, 1925.
Herpobdella punctata (Leidy) 1870.
 Madelin Lake, Oneda Co., Metzelaar and Langlois, Sept. 19, 1925.

CONCLUSION

In concluding this report I wish to state that this, though not complete, is a fair estimate of the leeches to be found in the State of Michigan. The leeches examined were in no essential features different from those found in other of the North, Central and Eastern States.

The leeches of this collection were, for the most part, in a coiled or contracted state making measurements mean but little. It was particularly evident from the collection that the Genus *Haemopsis* was in abundance, four species being recorded. This may have been due to their large size and slow moving habits. It was interesting to note that *Placobdella parasitica* was carrying young as early as March 15th, and as late as July 22nd. This tends to substantiate the theory of a number of broods in a season.

A table of the known food habits of the leeches of Ohio is included in this report. There is reason to believe that the Michigan forms would follow essentially the same food habits as Ohio species.

The value of this study is in the knowledge it affords of the occurrence and distribution of Michigan leeches.

TABLE I
THE FOOD OF LEECHES OF OHIO

	Turtle	Fish	Snail	Aquatic annelid	Earthworm	Insect larvae	Organic debris	Mammals	Frogs	Scavengers
<i>Glossiphonia stagnalis</i>		x	x	x		x		x	x	x
<i>Glossiphonia nepheloidea</i>		x	x	x			x			x
<i>Glossiphonia fusca</i>		x	x	x		x				
<i>Glossiphonia complanata</i>			x	x						
<i>Placobdella montifera</i>		x	x					x	x	
<i>Placobdella parasitica</i>	x			x						
<i>Placobdella rugosa</i>	x		x							
<i>Placobdella picta</i>	Unknown									
<i>Placobdella phalera</i>	Unknown									
<i>Actinobdella inequiannulata</i>	Unknown									
<i>Piscicola punctata</i>		x								
<i>Macrobodella decora</i>	x	x		x				x	x	
<i>Haemopsis grandis</i>			x	x	x	x	x			x
<i>Haemopsis marmoratis</i>				x	x	x	x	x		x
<i>Haemopsis lateralis</i>				x	x	x		x		
<i>Haemopsis plumbeus</i>					x		x			
<i>Herpobdella punctata</i>			x	x		x		x	x	
<i>Dina microstoma</i>				x						
<i>Dina fervida</i>				x		x				

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